B&W ADVANCED TECHNOLOGY LESSON PLAN

Lesson No. 506-42	Title: OCONEE-2 TUBE LEAK EVENT

Written by: G. A. Van Sickle	Approved by: [illegible signature]	Date: 11/15/91

	1.0 Training Aids 1.1 Transparencies for B&W Advanced Manual Chapter 31
	2.0 Reference Material 2.1 B&W Advanced Manual - Chapter 31 2.2 B&W EOP Manual - Chapter 6 2.3 INPO 82-030, "Analysis of Steam Generator Tube Rupture Events at Oconee and Ginna," November 1982
	3.0 Objectives 3.1 List the symptoms of a steam generator tube leak. 3.2 Describe the actions that should be taken if the tube leakage exceeds technical specification limits. 3.3 List three actions that can be taken to minimize offsite releases during steam generator tube leakage events.
Sequence of Events Attachment	4.0 Presentation - Event Chronology 4.1 Initiation of the Leak 4.1.1 Initial conditions: Power escalation following mid-cycle outage.
Objective 1	4.1.2 Evidence of leak: a. High condenser off-gas monitor reading. b. High activity from air ejector grab samples.
Objective 3	4.1.3 "Control of Secondary Contamination" implemented: a. Turbine building and Powdex (condensate polisher) sump pumps secured. b.Potentially contaminated drains rerouted from turbine building sump to hotwell pump sump.
Objective 1	4.1.4 More leak evidence: a. Off-gas monitor reading off-scale high. b. High reading on B steam line radiation monitor. c. Leak calculated at 25 gpm from air ejector grab sample.
Objective 2	4.2 Shutdown and Leak Isolation 4:2.1 Controlled shutdown executed; SGTR procedure not entered because normal makeup maintained PZR level.
Objective 3	4.2.2 Steam pressure was maintained below MSSV set pressure.

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	4.2.3 B OTSG was isolated. (Note: No MSIV's at Oconee; closure of turbine stop valves and B-side TBV's isolated the OTSG on the steam side.)
	4.3 Plant Cooldown
	4.3.1 Cooldown on A OTSG.
	4.3.2 HPI initiated to make up for leakage, cooldown "shrink."
Figure 31-1	4.3.3 B OTSG pressure was saturation pressure for T_c.
Figure 31-2	4.3.4 Steam line temperatures remained higher than OTSG saturation temperatures, reflecting slow cooling of steam line metal.
Figure 31-1	4.3.5 OTSG A level decreased to low-level limits; OTSG B level increased with leakage.
Objective 3	4.3.6 OTSG B was periodically drained to hotwell through hot blowdown lines; this prevented filling main steam lines but contributed to hotwell and eventual turbine building sump contamination.
	4.3.7 One DHR hot-leg suction isolation valve failed to open electrically from control room. Valve eventually opened several hrs. later. During delay, RCS pressure for RCP operation was maintained, keeping leak driving force high.
	4.3.8 Event terminated with pumpdown of RCS loops.
	4.4 Turbine Building Flooding and Decontamination
	4.4.1 Condensate storage tank (CST) overflowed to turbine building sump twice during event.
	a. Overflows were largely due to condensate surge volume arrangement. Upper surge tanks (UST's) are kept nearly full for AFW capacity requirement. UST's overflow to CST, which overflows to turbine building sump.
	b. Condensate system realignments resulted in surge volume upsets. Since OTSG B was being drained to the hotwell, this caused overflow of contaminated water to the turbine building sump.
	4.4.2 FWP seal injection sump overflowed to turbine building sump while seal injection sump pumps were OOS.
	4.4.3 Decontamination involved processing of 2.5 million gallons of water.